QUEENSLAND AGRICULTURAL JOURNAL

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Agriculture.

PRODUCTS OF THE MAIZE PLANT.

Of the multifarious products obtained from all parts of the maize plant in Europe, the United States of America, and other countries of the world, Australia produces but two—cornflour and horse-feed (either grain or green, or in the form of ensilage). In 1914, 176,372 acres were under maize in Queensland, which yielded 4,260,673 bushels of grain. The maize harvest in the following year was a poor one, amounting to a little over 2,000,000 bushels. Taking the cob as representing 18 per cent. of the ear, it will be seen what a vast quantity of cobs has been produced only to be destroyed as valueless. Now these cobs have a very considerable value as stock food, as has long ago been demonstrated in the long-continued general experience of American farmers. Apart from this, a ton of ordinary wood when burnt only gives 100 lb. of potash, 32 lb. of phosphoric acid, and 640 lb. of lime. But a ton of corn cobs burnt into ash gives 500 lb. of potash, 90 lb. of phosphoric acid, and 140 lb. of lime. So much for the manurial value of the cobs.

What are we losing in the way of other products of the maize plant? Generally speaking, people have no idea of the thousand and one ways in which the Americans utilise maize. This plant is to them more precious than is the bamboo to the Orientals. The pith of the stalk

is converted into cellulose, which is utilised in the manufacture of smokeless powder and other high explosives in vast demand during the present war. Cellulose is largely used for packing cofferdams and belting of battleships; pyroxiline varnish is a liquid made from cellulose, the uses of which are practically unlimited. The pith is used as an insulating material in refrigerating chambers and cars, ships' holds, electric dry batteries, and as casing for pipes of steam generators. It also enters largely into the manufacture of a washable floor cloth superior to linoleum.

Besides being put to these uses, the pith of the maize stalk is used in enormous quantities in dynamite factories under the name of "wood meal."

Out of the spathes or husks covering the cob is produced a material which, in America, is utilised to manufacture various tissues, straw mats and hats, and, above all, a tough parchment paper for envelopes and bank notes. Every part of the plant can be utilised. The stalks and leaves are used in a thousand industries.

Besides starch, another product of the grain is dextrine for fixing the colours in cloth. Whisky, eau-de-cologne, &c., are distilled from it. Enormous quantities of glucose are manufactured from maize, and this actually finds its way to the tables of fashionable America under the name of golden syrup.

The grain is also made to produce a bright, tasteless oil, which is largely used in adulterating olive and cod-liver oil.

Finally, rubber is extracted from it by vulcanising the oil.

Briefly, every conceivable product is obtained from maize except crystallisable sugar, as maize sugar will not granulate, for which reason it is made into golden syrup.

The finest book paper can be made out of the stalks.

All these products have for years been left to rot in the fields of Queensland farmers. Not even have any farmers utilised the cobs by grinding them into stock food as is done in America. When shall we wake up to a sense of the hidden wealth in our Queensland products, and come to the front with these products as do the Americans?

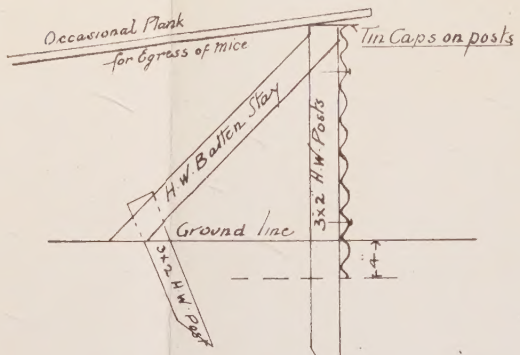
PROTECTING WHEAT STACKS FROM MICE.

In response to a request from the Department of Agriculture and Stock, Brisbane, for information in regard to the methods adopted in New South Wales for destroying mice in wheat stacks, Mr. G. Valder, Under Secretary and Director, Department of Agriculture in the

Open space for storm water
Open space from 5 ft. to 12 ft wide
WHEAT – STA
Open space 5ft to
Note!
Special trap to drain
with traffic plate or otherwise prote
fence
BLOCK-F
1/8" Scale

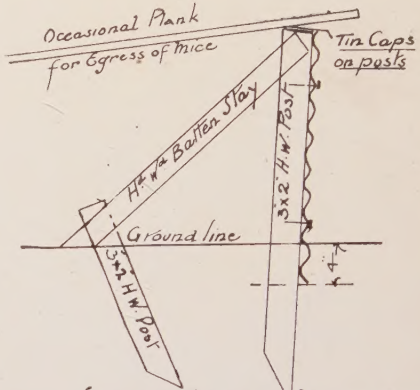
Detail Drawing of Mouse Proof Fence

Around Wheat Stacks



Section (With post plumb)

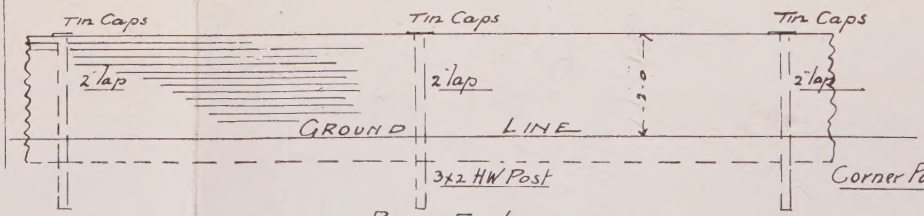
Inch scale



Section (With fence leaning 2" Outward)

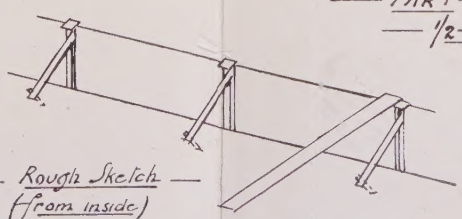
Inch scale

Alternative

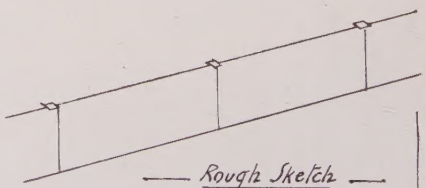


Part Elevation

1/2 Inch scale



Rough Sketch
(From inside)



Rough Sketch
from Outside

Railway Line

Fence

et Wide

outlet

M

Southern State, has courteously supplied the following information on the subject:—The stacks are being protected by means of mice-proof galvanised iron fences, and various methods for the destruction of the mice within the stacks are being used, such as kerosene tins half full of water laid in the ground to act as traps; also poison, where it can be safely used, and means of allowing the mice to leave the stack over the fence without being able to return to it. Mr. Valder also forwarded a sketch showing the method of erecting the fence which is here reproduced. The cost of galvanised iron has been considerably advanced since the rise in price of metals during the war, but second-class iron, even perforated by nail holes, would prevent the mice from getting through. New iron is quoted at from £70 to £81 per ton. Second-hand with nail holes 5s. 2d. per sheet.

COTTON SEED FOR DISTRIBUTION.

Cotton-ginning at the Department of Agriculture and Stock commenced last month, and seed will be supplied to intending planters gratis on application to the Under Secretary, stating what area the applicant intends to plant. In July, 1916, the total quantity of cotton purchased by the Department from farmers was 29,500 lb. In the same month of 1917 the quantity purchased was 59,000 lb. and consignments were still coming in.

MARKET GARDENING.

A NEW METHOD OF SELECTING TOMATOES FOR RESISTANCE TO THE WILT DISEASE.

BY C. W. EDGERTON.

Perhaps the most serious disease of tomatoes in the southern United States is that caused by *Fusarium lycopersiei,* commonly known as the tomato wilt. The fungus lives in the soil and attacks plants through the roots, later growing up through the fibrovascular bundles into the stems. In this, as in similar diseases, the only practical method of control now known is in the use of varieties, or strains, that are resistant to the disease. By saving seed from healthy plants in a badly infected field for several seasons, strains can be obtained which show considerable resistance to the disease. This method has, however, several drawbacks: (1) Many of the plants in the field do not come in contact with the wilt

fungus during the season and so do not have a chance to show whether they are resistant to the disease; (2) resistant plants in the field are readily pollinated by the susceptible plants; (3) the time necessary to obtain a wilt resistant strain is too long.

To avoid all these drawbacks, the writer has tried to improve on the old method by selecting resistant plants from the seed bed.

In ordinary unsterilised soil, even if it is heavily inoculated with the tomato wilt fungus, not many of the plants will show the wilt to any extent before it is time to place them in the field. The presence of bacteria and other fungi seems to have an inhibitory effect on the wilt fungus. If, however, the soil is first sterilised by heat and then heavily inoculated with the wilt fungus just before planting, the disease will develop so well that all the plants will be attacked and the most susceptible will be killed before they are large enough to be placed in the field. This guarantees the degree of resistance of the surviving plants which are placed in the field.

To show how this method works in practice, results of some experiments may be briefly given. Having by the old method of selection obtained a strain that showed considerable resistance to the wilt disease, this was compared by the seed-bed method with three standard varieties of tomatoes. The seeds of each variety were planted side by side in reinoculated sterilised soil. Different cultures of the fungus from different localities were also used in order to see if they would affect the varieties differently. In the following table are given the percentage of living plants and of wilt-free plants of each variety sixty-eight days after planting.

Variety.	CULTURE A.		CULTURE B.		CULTURE C.		CULTURE D.	
	Living.	Healthy.	Living.	Healthy.	Living.	Healthy.	Living.	Healthy.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
"Stone"	35·3	11·8	75·0	55·0	44·7	25·5	71·4	57·1
"Acme"	14·3	0·0	42·9	28·6	31·3	21·9	65·8	31·6
"Earlianna" ..	32·3	3·2	63·5	36·5	37·3	17·7	96·0	70·0
Wilt-resistant ..	62·5	31·3	81·8	56·8	68·2	34·1	95·1	78·0

This table shows the comparatively greater resistance of the wilt-resistance variety as compared to the others, and it also shows the large percentage of susceptible plants that could be eliminated before setting in the field.—"Bull. of Foreign Agric. Intelligence," October, 1916, Department of Agric., Ottawa.

OLD *VERSUS* NEW SEED.

Fresh seed usually germinates more promptly than old seed, although there may be advantages in sowing old seed. Many gardeners claim that fresh seed of the cucurbits (melons, pumpkins, cucumbers, gherkins, &c.) tends to produce more vine and leaf and less fruit than seed several years old. But fresh seed is generally preferred, especially in the case of the onion and parsnip when the vitality of the seed is low. As far as pumpkins and cucumbers are concerned, we have obtained excellent crops from seed two years old, and also from melon seeds (the Rockyford musk melon) imported from America, some of the seed of which was sown more than two years afterwards and the vines bore heavily. The life of seeds depends upon (1) the kind of vegetables, (2) conditions under which they were grown, (3) thoroughness of curing, (4) storage conditions.

There is a common belief among growers of pumpkins that to get the best results, new seed should not be used; it should be two or three years old. And there is scientific evidence to support that belief. The tendency is for seeds to give less vigorous development as they are old; in other words, their vegetable capacity decreases. Plants raised from fresh seed tend toward a more robust growth than do plants from older seed.

A New South Wales departmental expert mentions an actual case where a trial was made between new and old pumpkin seed. The plants grown from new seed were the largest and strongest; those from old seed came later, and were weaker plants, but returned a much larger yield in fruit. In this trial the strong barren plants were nipped back, and the laterals that developed carried a much better supply of fruiting flowers.

There is other evidence to show that if the original stems grow vigorously and unchecked, they tend to throw mainly male (pollen-bearing) flowers; but that if the ends be pinched off when young, only four or five leaves being left, lateral branches will come away, on which the proportion of fruiting (female) flowers will be much greater.

This seems to bear out the statement that strong vines may tend to fruit indifferently, whereas weaker plants, or plants that have suffered a check, produce many fruiting flowers, and, consequently, give a much better return in fruit.

Mr. F. F. Coleman, Inspector under the Pure Seed Act, Department of Agriculture and Stock, Queensland, when on a visit to M. Vilmorin's establishment in France, found that experiments had been made there with cucumber seeds ten years old, and such seeds produced vines laden

with fruit. M. Vilmorin did not continue his experiments, as he considered enough had been done to show that very old cucurbit seed was even more productive than fresh seed, and Mr. Coleman had personally verified this by growing cucumbers from ten-year-old seed.

The following table given in R. L. Watts's (Professor of Horticulture in the Pennsylvania, U.S.A.) excellent work on "Vegetable Gardening" shows the maximum ages of properly cured and stored vegetable seeds when they will be likely to germinate satisfactorily. But he remarks that it is not best to place too much reliance upon tables of this character, the only certain means of determining the vitality of seeds being to make germination tests:—

Seed.	Years.	Seed.	Years.
Artichoke	2	Musk melon (rock melon)	5
Asparagus	2	Okra	4
Bean	3	Onion	1
Beet	4	Parsley	1
Cabbage	3	Parsnip	1
Carrot	1	Pea	3
Cauliflower	4	Pepper	3
Celery	2	Radish	2
Cucumber	5	Salsify	2
Egg plant	5	Squash (pumpkin)	3
Endive	2	Tomato	5
Kale	2	Turnip	4
Kohl-rabi	3	Water melon	5
Leek	3		
Lettuce	4		

LAYING OUT A SMALL ORCHARD.

If the land is laid out in equilateral triangles, more trees may be planted to the acre than on the square system. By the former arrangement half an acre will carry 97 trees, whereas by the latter only 85 trees can be planted. There is a further advantage gained by the triangular or, as it is called, the septupal system, which is, that the land can be cultivated in three different directions, a great consideration is these days of high cost of labour.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towleston," Kingsthorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	2	6	Ayrshire Herd Book of Queensland
		2	3	Holstein-Friesian Herd Book of Australia
		3	13	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	9	37	Holstein-Friesian Herd Book of Australia

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
R. Conochie	Brooklands, Tingoora	9	21	Queensland Jersey Herd Book
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Frisian Herd Book of Australia
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Australian Hereford Herd Book
W. F. Savage	Ramsay	1	12	Illawarra Herd Book of Queensland
Tindal and Son ..	Gunyan, Inglewood	50	400	Australian Hereford Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Queensland Jersey Herd Book
J. H. Fairfax	Marinya, Cambooya (2)	9	55	Ayrshire Herd Book of Queensland
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Bock
J. Holmes	"Longlands," Pittsworth	6	20	Ayrshire Herd Book of Queensland
P. Biddles	Home Park, Netherby	1	20	Illawarra Dairy Cattle Association
A. Rodgers	Torran's Vale, Lanefield	1	9	Milking Shorthorn Herd Book
R. S. Alexander ..	Glenlomond Farm, Coolumboola	1	..	Holstein-Frisian Herd Book of Queensland
State Farm	Warren	3	83	Ayrshire Herd Book of Queensland
S. H. Hosking.. ..	Toogooloowah ..	2	15	Holstein Cattle Club Herd Book
W. J. H. Austin ..	Hadleigh Jersey Herd, Boonah	1	2	Queensland Jersey Herd Book
Ditto	ditto	..	6	Commonwealth Standard Herd Book

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

Milking Returns of Cows from 27th May to 26th June, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Margaret	Ayrshire	14 Sept., 1916	734	4·6	39·78	
Lady Melba	Holstein	14 Feb., 1917	934	3·5	37·84	
Miss Betty	Jersey	27 Mar. ,,	546	5·0	32·23	
Snowflake ...	Shorthorn... ...	17 May ,,	568	4·6	30·78	
Iron Plate ...	Jersey	9 Dec., 1916	484	5·3	30·32	
Miss Edition	,, ...	25 Dec. ,,	484	5·2	29·72	
Miss Security	,, ...	27 Mar., 1917	625	3·9	28·66	
Lady Loch II.	Ayrshire	3 June ,,	500	4·6	27·10	
Skylark ...	,, ...	24 May ,,	605	3·8	26·95	
Cocoatina ...	Jersey	6 Mar. ,,	526	4·2	25·97	
Buttercup ...	Shorthorn... ...	2 June ,,	646	3·4	25·66	
Hedges Madge	Holstein	22 Mar. ,,	643	3·4	25·54	
Lady Annette	Ayrshire	11 Nov., 1916	369	5·8	25·33	
Belinda ..	,, ...	23 Feb., 1917	535	4·0	25·13	
Lady Spec...	,, ...	17 Jan. ,,	540	3·9	24·71	
Violette's Peer's Girl	Jersey	13 Dec., 1916	343	6·0	24·37	
Glade ...	Shorthorn... ...	29 Mar., 1917	588	3·5	24·07	
Comedienne	Jersey	24 Nov., 1916	366	5·3	22·91	
Thornton Fairetta	,, ...	26 May ,,	272	7·0	22·59	
Hedges Dutchmaid	Holstein	22 Aug. ,,	365	5·0	21·53	
Jeanni ...	Ayrshire	27 Oct. ,,	403	4·5	21·35	
Sylvia II. ...	Shorthorn... ...	16 Jan., 1917	489	3·7	21·19	

The cows were fed on a ration of Japanese millet ensilage, with wheaten and lucerne chaff, in addition to natural pasturage.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JUNE, 1917.

Five thousand nine hundred and seventy-three eggs were laid during the month. The health of the birds has been exceptionally good, not a case of sickness requiring treatment has occurred. Most of the pens which broke into moult during the previous month are now in full lay. Weather on the whole has been good, with the exception of some very cold nights. Only five cases of broodiness have occurred among the heavy breeds, and none among the light breeds during the month. The selection of the birds eligible for the "True to Type" prizes has been made, but the publication of these is reserved for next month, when the weight of eggs will also be given and a full report submitted. Mr. J. M. Manson wins the monthly prize in the light breeds with a score of 197 eggs, while Mr. E. F. Dennis wins in the heavy breeds with 120 eggs. The following are the individual records:—

Competitors.	Breed.	June.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns	122	361
W. Becker	Do.	97	307
*G. H. Turner	Do.	127	303
Oaklands Poultry Farm	Do.	104	288
W. R. Crust	Do.	92	279
A. H. Padman, S.A.	Do.	93	270
G. Chester	Do.	74	269
T. A. Pettigrove, Victoria	Do.	96	266
*J. Zahl	Do.	104	266
T. Taylor	Do.	97	259
*J. R. Wilson	Do.	85	253
F. W. Loney	Do.	100	349
*A. W. Bailey	Do.	92	249
T. B. Hawkins	Do.	75	247
Moritz Bros., S.A.	Do.	133	243
Chris. Porter	Do	102	243
C. Knoblauch	Do.	101	234
*A. T. Coomber	Do.	101	227
J. G. Richter	Do.	98	224
Mars Poultry Farm	Do.	75	222
*J. M. Manson	Do.	137	213
R. Holmes	Do.	60	210
Kelvin Poultry Farm	Do.	120	207
*Mrs. J. R. D. Munro	Do.	89	206
A. Shillig	Do.	107	202
Quinn's Post Poultry Farm	Do.	111	198
D. Fulton	Do.	90	197
*Dixie Egg Plant	Do.	90	190
G. Williams	Do.	76	185
F. Clayton, N.S.W.	Do.	73	169

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	June.	Total.
LIGHT BREEDS—*continued.*			
*T. Fanning	White Leghorns ...	82	167
J. L. Newton	Do.	101	166
Mrs. W. D. Bradburne, N.S.W. ...	Do.	58	165
*C. C. Dennis	Do.	94	160
E. Cross	Do.	36	157
Miss Hinze	Do.	80	153
L. G. Innis	Do.	80	151
*A. E. Walters	Do.	103	133
J. Holmes	Do.	82	134
C. P. Buchanan	Do.	71	131
C. H. Singer	Do.	33	130
G. J. White	Do.	95	128
Mrs. J. Carruthers	Do.	35	126
G. Howard	Do.	90	124
S. C. Chapman	Brown Leghorns... ...	82	120
E. A. Smith	White Leghorns ...	58	114
J. Ferguson	Do.	70	114
Mrs. S. J. Sear	Do.	25	114
*Dr. E. C. Jennings	Do.	56	99
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	116	283
A. E. Walters	Do.	93	251
W. Smith	Do.	90	249
*Mars Poultry Farm	Do	113	248
F. A. Claussen	Rhode Island Reds ...	68	215
D. Kenway, N.S.W.	Black Orpingtons ...	92	213
W. S. Hanson, N.S.W.	Do.	95	211
H. Jobling, N.S.W.	Do.	52	192
Cowan Bros., N.S.W.	Do.	90	190
P. C. McDonnell, N.S.W.	Do.	97	198
*E. F. Dennis	Do.	120	176
F. Clayton, N.S.W.	Rhode Island Reds ...	68	162
King and Watson, N.S.W.	Black Orpingtons ...	100	147
Mrs. J. H. Jobling, N.S.W.	Do.	65	136
*Oaklands Poultry Farm	Do.	38	102
C. C. Dennis	White Wyandottes ...	74	98
C. B. Bertelsmeier, S.A.	Black Orpingtons ...	58	90
R. Burns	S. L. Wyandottes ...	80	83
*F. W. Leney	Rhode Island Reds ...	42	80
*Kelvin Poultry Farm	Plymouth Rocks ..	28	70
*E. A. Smith	Black Orpingtons ...	45	56
E. Morris	Do.	27	40
J. M. Manson	Do.	29	40
*Miss M. Hinze	Do.	32	33
Totals	...	5,973	13,405

* Indicates that the pen is engaged in the single hen test.

RESULTS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
G. H. Turner	30	52	61	56	47	57	303
J. Zahl	52	41	61	17	57	38	266
J. R. Wilson	44	43	37	44	50	35	253
A. W. Bailey	35	25	49	48	47	45	249
A. T. Coomber	46	4	49	47	31	50	227
J. M. Manson	40	30	29	28	36	50	213
Mrs. J. R. D. Munro	64	42	24	27	2	47	206
Dixie Egg Plant	27	37	40	47	39	0	190
T. Fanning	6	45	34	33	17	32	167
C. C. Dennis	31	23	0	32	34	40	160
A. E. Walters	10	20	15	32	39	17	133
Dr. E. C. Jennings	2	6	13	27	42	9	99
R. Burns	29	11	58	32	72	81	283
Mars Poultry Farm	41	57	32	52	34	32	248
E. F. Dennis	25	21	43	41	44	2	176
Oaklands Poultry Farm... ...	44	2	8	7	41	0	102
F. W. Leney	4	4	0	2	48	22	80
Kelvin Poultry Farm	21	1	0	47	0	1	70
E. A. Smith	1	0	9	35	10	1	56
Miss H. Hinze	9	5	1	10	8	0	33

POULTRY AT THE RANGEVILLE STATE SCHOOL.

We have received from Mr. Thos. Henderson, Head Teacher of the Rangeville State School, the following interesting notes on the instruction given to the scholars in poultry-breeding and egg production. The poultry yard was started in the beginning of the year, and an account of it and its feathered occupants appeared in the issue of the Journal for February, 1917:—

At present one pen of white leghorns is being kept in the Semi-Gordon House. They belong to Mr. R. Holmes, of Harlaxton. Some of the birds are Grantham strain, others champion, and the remainder a cross between Mr. Holmes's birds and Mr. E. A. Smith's, of Paddington, Brisbane.

The six birds laid 107 eggs for the month of May. They are fed on wet mash, which consists of bran, pollard, and desiccated meat mixed up with boiling water until it is quite crumbly and not sticky. Dry mash is also before them in a hopper. The dry mash consists of dry bran and pollard and dried blood. We are feeding these birds on wet mash, owing to a wish expressed by Mr. Holmes, who raised the birds on wet mash, and as a change to dry mash would probably put them off laying. Wheat is fed for grain, and is dug into the scratching material on the floor. The scratching material is horse manure. This has many advantages—(1) The ammonia in the manure eradicates vermin, and the need of a dust bath is thus abolished; (2) the value of the manure is increased for gardening purposes when removed.

Mr. Beard, the Government poultry expert, claims that birds, when fed on wet mash, lay more eggs and also larger eggs than birds which

are fed on dry mash. We, however, prefer dry mash, as it requires less labour and time, is more sanitary, easier handled, and in laying competitions has produced results equally as good as those obtained by feeding on wet mash.

Three trap nests have been installed to show the children how birds in a large pen may be individually tested as layers. When a hen enters a nest a bar drops down, which locks her in until released, and the attendant may see whether she has laid or not. The nests are kept outside the building, and have a hinged roof, which is lifted up to gather the eggs. The water also is kept outside, and the tin has two rectangular holes cut on opposite sides, and a slight draught is caused over the water, and this keeps it cool. The reason for keeping the nests and water outside is for convenience and quickness of attending to these two factors. The birds roost on a perch, under which is suspended a dropping board, which is cleaned every morning. Both perch and dropping board are hung on wires in order to prevent vermin, if any happen to be there, from going from the roosting quarters to the house and *vice versâ*.

Green feed is given every day. It is hung in the middle of the pen, and the fowls eat it as they wish.

Shell grit and crushed-up crockery are supplied in an automatic self-feeding hopper.

The pens are cleaned every morning, and all the work is done by the scholars, whose ages range from 6 to 14.

THE FOWL TICK.

Mr. J. Beard, Instructor in the Poultry Industry, Brisbane, has given the following valuable information concerning the Fowl Tick, the symptoms of its presence in the poultry yard, and the remedies for and prevention of its attacks. This information is of very great importance to poultry breeders, and should be carefully studied by our readers who are interested in the industry.

SYMPTOMS.

Fowls that have been infested by ticks and recover become immune from further attack. This explains the reason why sometimes flocks of fowl are apparently in the best of health and condition, yet, if examined, they will be found to be covered with the larval ticks, and the houses may be found swarming with the pest. If clean fowls are put into these yards they will at once become affected and, in three or four days, the result of tick worry and inoculation by the pest, fever will be at its height. The fowls will appear drooping and listless, the combs becoming quite pale; they then lose the use of their legs. Severe diarrhœa sets in, death resulting in a few hours. The better condition the clean birds are in the quicker the poison will act. The fowl ticks themselves are infested with a parasite which they pass into the blood of the fowl, where

it becomes a blood parasite, and the micro-organisms multiply with such marvellous rapidity that, in most cases, the fever causes the death of the birds. Every bird, in turn, becomes a centre of infection for healthy ticks that suck its blood, thus becoming in turn infected, and transmitting the blood parasites into a fresh victim. This disease is known as Spirochaetosis in fowls and is caused by a blood parasite. This tiny organism is conveyed from ticks to healthy fowls through the bite of the commonly known poultry tick (*Argus persicus*), its incubation period ranging from three to nine days.

The ticks are capable of transmitting the disease to healthy birds five months after feeding upon the blood of (*Sphiro-chaeta*) infested fowls.

All poultry, fowls, ducks, geese, and turkeys, are subject to the disease, but the losses are always greater amongst the first mentioned. This may be accounted for by the fact that the latter are more restless in their habits, therefore the "seed" ticks have not such opportunities of attaching themselves to these birds.

REMEDY AND PREVENTION.

Once the ticks have firmly established themselves in the fowlhouse, it is almost impossible to eradicate them. Therefore the houses and fences should be burnt, likewise any trees that may have been in the pens, and the ground thoroughly disinfected with some strong solution. From experience the following have been found very effective remedies:—Pure kerosene, crude petroleum, creosote, or some of the standard dips, used at a strength of one part of the dip to three parts of water.

The new houses should be of iron, with as little woodwork as possible. The perches, which should be tick proof, can be procured at almost any ironmongery or poultry supply store. A good plan for a perch is to put two supports of sawn timber into the ground. Drive a nail into each at the top; bore a hole in each end of the perch so that the nail will just go through, and then lay the perch in the supports. This will keep it in position, and the perch can be lifted up to see if any ticks are underneath. Tie a piece of flannel round each support of the perch about half way up and, if there are any ticks about, you will in time catch them all, as after feeding on the fowls they will start for their hiding place but, being full and lazy, will take the first shelter offering, thus you will find them under the perches or under the flannel. The latter can be removed and be burned along with the ticks that hide in it, and be replaced with fresh clean flannel.

Every care should be exercised to ascertain that all birds coming into the yard are clean and free from diseases and pests. If there is the slightest doubt, the birds should be placed in strict quarantine for

nine days and the coops in which they have been kept thoroughly inspected. If young ticks are discovered clinging to the bodies of the fowls, the birds should be dipped in a strong solution of phenol or Cooper's sheep dip, which will kill the pests. After the birds have been dipped in the solution they should be given a teaspoonful of port wine every few hours, and kept in a dry, warm place.

If the fowlhouses are not badly infected the tick can be eradicated by thoroughly spraying with some of the solutions previously mentioned.

On account of its cheapness and the fact that it is so easily prepared, the following is recommended:—Boiling hot soapsuds, to which add ½ oz. crude carbolic to the bucketful. The action of this solution is sure, and if properly applied it will penetrate into the smallest cracks and crevices, which a thicker solution would not reach.

Hot coal tar is also a good thing to use on fences and buildings, but care must be taken that it gets into all the cracks.

If whitewash is used, care must be taken that it is not applied too thick, because as the wash dries a space is left between it and the wood, which makes a good harbour for the pests.

There is yet another method which I have found to be very effective and that is the use of a blow lamp (such as painters use). The heat and flame from this lamp will penetrate into the smallest cracks and kill all pests that may be concealed therein.

If the poultry keeper will follow out these simple instructions, his yard should soon become free from the pest, and if it does not remain so, he will only have himself to blame for lack of the precautionary measures suggested in regard to the introduction of fresh birds, coops, &c., or non-observance of those warnings contained therein.

FRUIT CANNING WITHOUT SUGAR.

A correspondent of the "Farm Journal," Sydney, writes:—

I came across a very good way of canning small fruits without sugar, and as I have been very successful with it, I thought someone else might like to try. Warm your bottle well in the oven, then fill with fruit. Pour in boiling water till it is as full as it can be. Put back in oven and leave until the bottle begins to boil again. Take out and put on rubber ring and screw top, previously well warmed. Stand jar on its head until cold, give an extra "screw" if necessary—and the thing is done. I did plums and nectarines early in the season, and they look lovely and are keeping well. I intend to do gooseberries and other materials now.

The Orchard.

SCARING BIRDS FROM FRUIT TREES.

A correspondent of the "New South Wales Agricultural Gazette," says he effectively overcame the bird trouble by making an effigy representing a hawk and suspending it on an overhead wire. This completely scared the small birds away, but the crows made a concerted attack on it. He therefore studded it all over with long darning needles, points outwards. On examination he found several of these broken off, and after a while the crows ceased to attack. The experiment was most successful as he had very little pecked fruit that season.

THE ORIGIN OF THE NAVEL ORANGE.

In the last month's issue of the Journal we published an article taken from the " Agricultural News" of Barbados, on the above subject. It was therein stated that the average annual production of forty-year-old trees in Brazil is about 100 oranges per tree, and the average annual rainfall in Bahia is about 50 inches. Mr. C. Ross, Instructor in Fruit Culture, says that in Queensland the average crop of these trees is about 400 per tree under lesser rainfall conditions, and forty year-old trees should produce even more. This contention is amply borne out by the average annual returns from Queensland orange plantations.

A FINE BUNCH OF BANANAS.

Mr. Kaminksi, owner of the "Sunbeam Fruit Farm," the Mountain, Nikenbah, sends a photograph, here reproduced, of a fine bunch of bananas and some pineapples grown on his orchard without the aid of any fertilisers. The banana bunch contains 20½ dozen good marketable fruit and the pines weighed 10 lb. each. The soil must be of first-class quality to produce such fruit without the application of manure, and the knowledge that this can and has been done should give great encouragement to those of our gallant soldiers who on their return from the European battlefield may elect to settle down to the peaceful life of fruit-farming on many of the suitable lands now being surveyed and reserved for returned soldiers. Nikenbah is 21 miles from Maryborough.

Mr. Kaminski has since stated that the soil on which the fruit was grown is practically new ground, and the bananas were of the third cutting, the pines, part of the fourth crop. The soil is of a grey colour and fairly stony, and the bananas thrive best amongst the largest stones. In fact, almost any fruit planted does well in the district as the majority of the land is highly situated and close to the sea.

Plate 6.—Bananas and Pineapples from Mr. Kaminksi's Farm, Nikenbah.

A GOOD NAVEL ORANGE.

We have received from Mr. John Williams, proprietor of Sunnybank Nursery, Sunnybank, a sample of a navel orange which was originally raised by Mr. Dunning, of the Blackall Range, from a seed obtained by Mrs. Dunning from a navel orange grown by her father, Mr. George Butt, of Montville. It is a remarkably fine example of that excellent variety of citrus fruits—the Navel, and is well worthy of a prominent place in the Orchard. "The Dunning," as the fruit has been named, is a large, clear-skinned fruit, seedless, with firm, juicy flesh of excellent flavour. Mr. Williams is a specialist in citrus propagation, and growers may depend on obtaining trees true to name from his nursery.

THE BANANA AND ITS BY-PRODUCTS.

In addition to the sale of the fruit itself, there are numerous side lines which add considerably to the value of the returns per acre, which in themselves range from £40 an acre upwards; in fact, it is often stated in Natal that a return of over £100 per acre from a well cultivated plantation is not excessive. Amongst the side lines may be mentioned such things as banana figs (a delicious confection), banana flour, banana coffee, and banana fibre, while many people will be surprised to know that banana wine is reputed to be a very refreshing drink. A most excellent whisky is also made from the banana, and some samples of it exhibited at the St. Louis Exhibition, after analysis by the Department of Agriculture in Washington, were awarded the gold medal. It has this advantage over malt whisky, that it is ripe at the end of one year, whereas malt whisky requires to be kept in cask for several years.

There are many other side lines which might be taken up, and if worked on a scientific basis would result in the establishment of a very substantial industry. Drying bananas for the manufacture of flour and figs has been carried out in Jamaica and other countries for several years past. In many cases drying is done in the sun, but it has been found much more expedient to dry the banana artificially, for which purpose a very elaborate mechanical process is employed, the fruit being placed in a vacuum chamber capable of handling several hundredweight of bananas per day.

A very valuable manila hemp is produced from species of musa bananas, and in Java several thousands of acres are devoted to this plant, and the fibre is valued at anything from £25 per ton upwards. Some samples of fibre produced in East Africa, and reported on by the Imperial Institute, were stated to be readily saleable in the London market and probably worth about £50 per ton. [£62 to £67 in June, 1917.—Ed "Q.A.J."] It is not necessary, however, to cultivate the banana for fibre, as the wild variety seems to serve the purpose quite well.

In the West Indies, where banana growing has been brought to a high state of perfection, special vans are employed for transporting the products on the railway, and specially fitted steamers convey the fruit to the British market.—"Agriculture News," Durban, S.A.

Tropical Industries.

PROSPECTS OF PLANTATION RUBBER AS A FIELD FOR PERMANENT INVESTMENT.

In three successive issues of our Journal last year, viz., Nos. 3, 4, and 5 of the current volume, we discussed the Plantation Rubber Outlook solely as regards prices, production, stocks and consumption of the commodity. We note from papers recently to hand from London that great interest is revived in rubber shares which, for some time past, have not received the attention they deserved, and a valued correspondent's remarks, published in our last issue, emphasise this fact. Although in some quarters, rubber shares are still regarded as "dangerous speculative investments," the majority of investors regard the shares of well-selected companies as good as gilt-edged securities. We have frequently been told by pessimists that the rubber industry has not stood the test of time, and there is, no doubt, some truth in it. The past six years, 1911-16, witnessed the establishment of the industry on a sound basis, and the returns have been steady and regular, but to the overcautious the period of transition from its infancy in 1900 to sturdy manhood in 1916 is not this view, but there is another long enough. We do not share the view, but there is another factor which must also be taken into account before arriving at a decision as to the claims of writers that the rubber industry, for investment purposes, offers security with large profits such as it is difficult to match elsewhere. The factor we refer to is that of America as the largest consumer of the world's production of rubber. We are quite aware of the inter-dependence of the two countries, but it may perhaps some day occur to the United States to keep away from the plantation market on the score of price. This, however, can only be a temporary measure, but the effect on the share market will be more than temporary. We mention this merely to show how far ahead some people are inclined to look.

The present time therefore is, we think, quite opportune to give the views of a well-known member of the London Stock Exchange who has for years specialised in rubber shares, and we consider, therefore, is in a position to speak with true knowledge of the industry and the market. We are tempted to quote largely from this admirable brochure, which has been kindly placed at our disposal.

In considering the rubber planting industry as a field for investment, says the writer, it is desirable for purposes of comparison to establish some unit of measurement. What shall it be? The unit most generally adopted in rubber planting circles is the acre of rubber.

An acre of rubber in full bearing yields 400 lb. Well managed companies produce them at 1s. per lb. inclusive of all charges, so a

selling price of 2s. per lb. leaves a profit of 400 shillings or £20 per acre. If it be granted that the rubber planting industry should yield a return of 10 per cent. per annum to the investor, then (if we capitalise on that basis this income of £20 per acre per annum) an acre of mature rubber will fairly represent a capital value of £200, assuming a permanent selling price of 2s. If the price at which we purchase shares represents a purchase of mature rubber at less than £200 per acre, the return on our investment will be proportionately enhanced. Local conditions, of course, may vary. Choice estates will yield as much as 600 lb. at maturity, and poor ones only 200 lb., but assuming an average of 400 lb. an acre and 1s. per lb. profit on these figures £200 an acre represents rubber on a 10 per cent. basis.

Perhaps the easiest way to grasp the question of the unit is to ask the question—What does a share in a rubber planting company represent? Let us take a company of £100,000 in £1 shares owning 1,000 acres of mature rubber. Each acre of rubber obviously represents £100 of capital, so each £1 share represents a hundredth of an acre of rubber. A man holding one hundred shares may be regarded as the owner of an acre of rubber.

Now the price at which rubber estates have been planted out and brought to the mature stage varies in a remarkable degree. In times past instances can be found of experienced planters who have achieved this result at £20 per acre. To-day, on the other hand, if a group of ordinary investors were to come together to take up and plant out land they would probably find by the time their rubber was mature it would have cost them about £50 per acre.

The following table will show how great is the variation in capitalisation at par of different companies:—

£1 Shares.	Capitalisation per Acre at Par.
Bukit Rajah	£17
Kuala Lampur	41
Lanadron	57
Tali Ayer	79
Grand Central	90
Seaport	105

2s. Shares.	Capitalisation per Acre at Par.
Cicely	£13
Linggi	14
Vallambrosa	15
Bukit Mertajam	69
Kamuning	83
Sengat	108

Other things being equal, it is obvious that the company with the lowest capitalisation per acre will give the highest return. It is equally obvious that there will be a tendency in the market for the shares of

the various companies to attain prices at which the return to the investor will be the same whatever share he buys. But a tendency must not be mistaken for an accomplished fact. With many investors sentiment is as powerful a factor as reason. Investors do not always choose the share which is the cheapest, but frequently that which looks the cheapest to their uninformed judgment.

Suppose, for example, three companies of equal merit each owning 1,000 acres matured rubber. Let A be capitalised at £20 an acre, B at £40, and C at £100. The profit of all three companies (on our previous figures of £20 an acre) will be identical, or £20,000 per annum, but the return will be 100 per cent. on A, 50 per cent. on B, and 20 per cent. on C. Logically, measured by the 1,000 acres of rubber each company possesses, and by the earning capacity of that rubber, the prices at which the £1 shares of A and B ought to stand,—if C stand at par,—are, A, £5; B, £2; but logical considerations only weigh with some investors, and only partially weigh with others, so it will be found in practice that the share which ought to stand at £5 will very likely stand at £4, and the share which ought to stand at £2 will not stand higher than £1 15s., and the reason is that the £1 share at £1 looks cheaper than the others at £2 and £5 respectively, although in reality it is not.

The writer proceeds to discuss the question of profit thus:—

If the profits on rubber planting be permanent, rubber investments should, we have indicated, go to a 10 per cent. basis. This brings us to the question—Will the present rate of profits be maintained? Must not the return on rubber fall to an ordinary commercial profit?

This question cannot be answered by a simple "Yes" or "No." In theory the answer will be "Yes, ultimately." In practice it will be found that the rubber producing industry is a peculiar one, embracing factors that tend to postpone indefinitely the "ultimately" that they be at once conceded for the sake of argument. Theoretically, if rubber planting continue to yield a profit of 100 per cent., if rubber be produced at 1s. per lb. and sold at 2s., there will be such a rush of capital into the rubber-planting industry that the result must be a vast increase in production, and a fall in price, with a consequent reduction in profits to an ordinary commercial level. Now capital can be invested in the rubber planting industry either by the purchase of land and starting of new plantations, or by the purchase of shares in existing plantations. It costs to-day (as we have stated) £50 an acre to bring a rubber estate to the producing stage, and for five years the capitalist has to forego all return on his capital. If he can acquire an acre of five-year-old rubber for £100 by a purchase of rubber shares and obtain at once a return of 10 per cent., rising by the end of five years to 20 per cent., per annum, it is obviously a far superior investment to buy shares of existing companies than to go in for a new plantation. Therefore, unless and until rubber shares rise to a level of say £150 to £200 an acre, no vast rush of capital into the rubber-planting industry has to be contemplated.

The yield per acre is carefully discussed, and the writer quotes the figures given by Mr. Henry T. Brice in his interesting work in 1911 and repeated in 1914, showing the fair average yields in pounds per acre for rubber at various stages. Working on these figures the average of 211 lb. an acre all over is arrived at as regards the area planted from 1905 to 1911. Judged by the results of the year 1915 the figures of Mr. Brice are borne out remarkably. A similar calculation for the year 1920 is made out and an average of 385 lb. an acre all over is shown. The presumption is, since the figures in the first table are not continued beyond 10 years, that the increase in yield would be 50 lb. per acre every year up to 1920.

The other points touched on and ably discussed are the World's Production and the Growth of Demand. Regarding the latter, the following remarks are made as to America's needs:—

For the past five years the annual consumption of rubber has been allocated roughly one half to the United States and one half to the rest of the world. In 1911, the United States took over 46 per cent. By 1915 the proportion had grown to 61 per cent. It is, then, upon consumption in the United States that the future of the rubber industry chiefly hangs. The following table shows how consumption is growing:—

	Increases in World's Production in Tons.	Increases in United States Consumption.
1911	4,000 ..	2,000
1912	24,000 ..	15,000
1913	9,000 ..	Nil
1914	12,000 ..	10,000
1915	39,000 ..	35,500

The development of motor traction is largely responsible for this. His motor-car hitches the backwoods farmer on to civilisation. The dweller in remote districts soon discovers that his automobile is not a luxury but the best-paying investment he ever made, and it is the thing he cannot afford to give up when hard times compel all-round economy.

If demand in the United States continues to maintain its recent rate of growth (and there seems no valid reason why this should not be the case), then it must assuredly before long overtake the prospective supply.

The following summing up is worthy of repetition.

One closing remark by way of afterword. In uninformed circles it is argued that rubber investment cannot be sound because the return is so high. Now that "highest interest means low security" is a sound maxim, but it applies to borrowers. Planting companies are not borrowers in the sense of the proverb, but are associations of shareholders planting their own land with their own capital. Their investment is with Mother Nature, who rewards her children with no niggardly hand. Moreover, the rubber planting industry is reaping the just reward of virtue in respect of the sound financial basis upon

which the great bulk of the companies were formed. Promoters' profits were small, there is little or no watered capital to pay a return on, so it is natural, right, and just that shareholders should get a large return on their investments on rubber. The rubber market is as safe a one for investment to-day as any other industrial market in the Stock Exchange, and safer than most. It has no troubles to contend with from organised labour; climatic conditions affect it to but a trifling extent. Months of flood or drought involve simply a slight curtailment of crop. Demand for the staple article produced is persistent both in Peace and War, for it is a necessity of both. Synthetic bubble after synthetic bubble has been exploded until the present low cost of production of rubber itself is safeguard against even a genuine synthetic product, were one forthcoming. On all of these grounds, then, the rubber share market is bound to be recognised in the future as a great field for investment, and that of the soundest and most solid description. Either other industrial securities will have to fall in price till they yield as big a return as rubber, or rubber securities must rise till they yield as small a return as other industrial securities. There is no escape from this dilemma. Rubber shares will not continue permanently on a 10 to 15 per cent. basis.—The "Fiji Planters' Journal," May, 1917.

THE PRODUCTION OF GOOD SUGAR-BEET SEED.

From the "Louisiana Planter," 3rd February, 1917.

From an excellent article on the beet sugar industry, by Dr. F. S. Harris, Director of the Utah Agricultural Experiment Station, we take the following notes on the method of raising good beet seed:—

"With most kinds of crops seed can be taken from the ordinary commercial product; hence the getting of seed is a very simple matter. With sugar beets, on the other hand, good seed is obtainable only by a great amount of work carried on in a systematic manner.

"DIFFICULTIES OF SEED PRODUCTION.

"The commercial production of sugar beet seed is beset with many difficulties. Probably the greatest of these is the maintaining of a strain of beets with high sugar content and yield. The fact that the sugar beet has, in recent times, been bred up from a plant with comparatively low sugar content to its present high standard makes it somewhat unstable, and unless selection is continued deterioration occurs very rapidly.

"This continuous selection requires men who are familiar with the principles of breeding as well as men who have skill in making chemical analysis of the mother beets. Those who raise the mother beets and produce the seed must also be acquainted with the method of handling the crop. All of these special requirements delay the introduction of the beet seed industry into a new region. The time necessary to elapse from when selection is begun until the first seed is ready for market is so

great that investors hesitate to put their money into the business. Those who want quick returns are not willing to spend the time necessary to build up a business based on the sale of products of merit.

"The production of sugar beet seed therefore is not a business for the individual farmer with limited resources, but can best be done by a company with resources to build up a good substantial business wherein the profits will depend on the establishment of a reputation.

"GENERAL METHODS.

"The approved method of producing seed requires a number of years of selecting and testing in order to get a strain possessing the desired qualities. Seed is saved from tested beets of selected strains. This is called 'mother seed.' This mother seed is then planted, and the beets which are obtained used as mother beets to produce the commercial seed two years later. Roots only are produced the first year after seed is planted. These must be dug and stored over winter, and the second year they are set out and produce seed.

"The difficult part of the operation is the securing of suitable 'mother seed.' After this is obtained the individual farmer can raise the commercial seed.

"GETTING THE MOTHER SEED.

"The mother seed used in raising the mothers which produce the commercial seed is obtained only at considerable expense and after a number of years of work.

"The procedure usually carried out is about as follows:—The first year a great many beets of desirable size and shape are analysed for sugar. The better individuals are siloed, and the second year are planted and produce seed. The third year the seed from each beet is planted separately, and the resulting beets analysed. From this analysis it is possible to tell which of the original beets with a high sugar content are able to transmit to their progeny this necessary quality. The poor strains are discarded and the good ones siloed, to be used the fourth year in producing the mother seed. The mother seed is planted the fifth year, and the beets obtained from it produce the commercial seed the sixth year from the time the work was begun.

"It is not safe to use all individual beets that have a high sugar content without making a test to see if that quality is transmitted, since the high sugar content may be due to the conditions under which the beet grew and not to its intrinsic high quality. It is not the mother beet with high sugar content that is desired, but the mother whose

progeny will be high in sugar. In testing strains it is a good thing to have standard seed for comparison growing in different parts of the test field.

"In getting beets from which the commercial seed is produced, the roots are left considerably thicker in the rows than where regular beets are to be raised. About eight pounds of seed are used to the acre, and the plants are not thinned. This method is used in order to save land, and also to save labour in handling the beets. Less storage space is required for the small beets than for those of full size. Being small does not seem to reduce the amount of seed produced. These small beets are called ' stechlinge ' or ' fingerlings.'

"SILOING.

"One of the most important operations in connection with seed production is the storing over winter, or siloing, of the beets that are to be used the next year in raising seed. At the Utah Station quite a number of methods of siloing beets have been tested, and a number of these have given good satisfaction. The important things to be kept in mind are that the beets must not be allowed to dry out or to heat. There must be sufficient ventilation to allow the carbon dioxide produced by normal respiration to escape and at the same time not enough to dry the beets. The beets must have sufficient covering to prevent freezing, but not enough to cause heating.

"Beets stored in dry sand kept the best of any method which was tried, although this method is perhaps not practical except for the comparatively few mother beets that have been individually analysed and are more likely to decay on account of the wound caused when the core is removed for analysis.

"For the large number of beets used in producing the commercial seed, perhaps the best way is to silo them right in the field. This is done by piling the beets on top of the ground or in a shallow trench in ricks 5 or 6 feet wide, and then covering them with straw and soil or with soil alone. Only a light covering is given at first and more added as the weather gets colder.

"Ventilators should be placed in the ricks every few feet to allow carbon dioxide to escape and fresh air to enter. If a long rick is made, the beets should be divided every 12 or 15 feet by straw or earth, so that if decay begins at any point it will not destroy all the beets in the silo. Before planting the beets in the silo it is a good thing to remove the tops, leaving enough of the crown and tops so that growth will begin the next spring. If mother beets are allowed to wilt before they are planted, the yield of seed is greatly reduced.

"PLANTING.

"The mother beets can be planted considerably earlier in the spring than the beet seed, since the old beets are not so sensitive to frost as the young plants starting from the seed. It is probably needless to say that the land should have been ploughed deeply. Experiments with a number of methods of planting and distances between plants have been made and the following method adopted as a result:—

"The land is marked each way about 30 inches apart and a beet dropped at each crossing of the marks. The best distance apart will, of course, depend on conditions. A long spade is pushed into the ground and the beet put in behind the spade as it is moved forward. It is important to get the beets well below the surface of the soil. The crown should be covered with a small quantity of soil to protect the budding top. The rows being the same distance apart each way, the cultivator can be run in two directions and much hand labour saved.

"CARING FOR THE SEED CROP.

"Cultivation should be begun early in order to conserve moisture and prevent the weeds from starting. If proper cultivation is given at first, but little will be necessary later.

"The seed crop does not require many irrigations, but it is very important to have the soil moist during the time seed is forming. But little work is necessary between planting and harvesting aside from cultivation and one or two irrigations.

"HARVESTING AND THRESHING.

"Since the seed does not ripen evenly, it is necessary to go over the field and cut some of the plants before all are ripe. The ripening period may extend over a number of weeks. The cutting is done with a sickle, and the seed stocks piled in the field to dry before threshing. It usually pays to go over the field after harvest with a brush and dusting pan to glean seed that has fallen to the ground in cutting. Threshing can be done with a regular grain threshing machine, and from 15 to 20 tons of seed can be threshed in a day.

"CLEANING.

"After the seed is threshed there is always a certain amount of dirt and stems remaining. These are best removed by running the seed over a revolving canvas, which allows the seed to roll off, and at the same time carries the stems away. The dirt and chaff are removed with a fanning mill before the seed is run over the canvas."

Entomology.

EXPERIMENTS IN POISONING CANE-GRUBS.

The following report has been received by the General Superintendent of Sugar Experiment Stations from the Assistant Entomologist to the Bureau (Mr. E. Jarvis) :—

Referring briefly to field experimentation with poison bait for cane-grubs, carried out lately at Innisfail and Meringa along the lines advocated in Bulletin No. 4 of this office, I may state that in the former locality a couple of acres were treated by Mr. F. L. Sugden, of "Johnstone River," but owing to the scarcity of grubs no damage to his crop was perceptible, either on this area or on immediately adjoining untreated cane land; so that the result of the experiment is left in doubt.

"One important point, however," writes Mr. Sugden, " appears to be definitely proved, that the application of even a heavier dose of Paris Green than you advised has had no injurious effect, but rather the reverse, on the growth of the crop."

The foliage of cane treated at Innisfail was noticed to be more luxuriant and of a darker green than that on the adjoining untreated area.

The above conclusion arrived at by Mr. Sugden verifies the author's opinion with respect to treated cane grown in pots at the laboratory last October. (Australian Sugar Journal, Vol. VIII., p. 741.)

Our half-acre plot at Mr. A. J. Draper's " Carrah" estate was treated with bait consisting of cowpea foliage dusted with copper arsenate.

The peas, which were sown on 25th January in trenches among cane planted last August, were duly poisoned and covered over on 14th February, the arsenical being applied at the rate of 24 lb. per acre.

Early in March the plantation on each side of this test plot—with the exception of a strip nine chains long containing a quarter of an acre adjoining its southern boundary, and about three acres on the northern edge of the 30-acre block—were treated by Mr. Draper with bisulphide of carbon.

At present the cane on our experiment plot is fully 8 feet high, and quite as flourishing as that growing on soil that was fumigated.

The untreated quarter acre appears to be suffering slightly, but owing to the foliage being over six feet in height, one can examine only the end of this strip, which is about 20 feet wide.

To form a correct opinion as to its condition it would be necessary to look down on it from above and compare the height and colour of the leaves with that of the cane on either side.

The three untreated acres on northern boundary, however, are already affected in places.

Presuming that grubs occurred early in the season over the entire area of this 30-acre block, we may, I think, reasonably conclude that arsenical poison-bait will destroy them just as effectively as fumigation with carbon-bisulphide.

The weather during the entire course of this experiment has been more or less showery, thus allowing affected plants to root afresh, and keep fairly green. In the event of normal dry conditions setting in we may expect to see more definite indications of grub attack on these plots at Meringa.

It will be interesting later on, when harvesting the cane, to determine the weight of yields per acre on treated and untreated areas.

THE QUEENSLAND GIANT RAT.

MOUSE.—

Yes. Mr. H. A. Longman (Queensland Museum), in his "Notes on the Classification of common Rodents," from which the illustrations of rats and mice in the June issue of this Journal were taken, mentions "The Giant Queensland Rat" (*Uromys macropus*), which is found in North-eastern Australia. There are seven specimens of this rat in the Queensland Museum from the Cardwell district. *Uromys banfieldi*, De Vis, from Dunk Island, north-east of Cardwell, is remarkable for the length of its teats. The *Uromys macropus* (big foot) measures over 12 inches over head and body, and the tail is about the same length. Its limbs are robust; the hind feet large, giving rise to the specific name *macropus* (big foot); the nails are large and broad at the base. The general colour above is greyish-brown tinged with reddish, with coarse black-tipped hairs intermixed; white below; whiskers very long, stiff and black; feet white; tail black on the basal, and white or pale-yellow on the apical half. It is said to be not uncommon in hollow trees in the plains, but Krefft stated that the animal frequented rocks more than trees, so that its habitat seems to be variable. Our illustration is taken by permission from Mr. Longland's work above mentioned.

Plate 7.—The Queensland Giant Rat.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Acting Government Botanist.

No. 10.

SIDA CORDIFOLIA, *Linn.*

Description.—A rather coarse branching undershrub, more or less clothed with a soft stellate tomentum of velvety hairs. Leaves rather long-stalked broadly cordate (heart-shaped) or almost orbicular, or rarely ovate, mostly 1-1½ in. diameter, rarely more, usually soft and thick. Flowers yellow on short axillary pedicels (flower-stalks) or clustered into short leafy racemes. Calyx softly tomentose, carpels about 10 together or sometimes fewer, opening at the top in two valves and terminating in rather long awns.

Distribution.—A native of tropical Australia, and a common weed widely spread throughout the tropics of the whole world. It is a great pest around some of the towns and townships of Northern Queensland, and during the past couple of years has appeared in the neighbourhood of Brisbane and some other Southern localities.

Common Name.—Though an abundant weed, I know of no vernacular applied to it; the botanical one—*Sida cordifolia*—is short, euphonious, and distinctive.

Uses.—It is generally left untouched by stock; though quite wholesome the hairy nature of its leaves and the fibrous nature of the stems make it of very slight value as a fodder. Like other species of the genus it is held among the Hindus and other Asiatics to possess considerable medicinal virtues, the only one of any value probably being the use of its mucilage mixed with rice in cases of dysentery.

Eradication.—In small areas hand pulling is the most effective method; in larger areas cutting off below the surface of the soil or where the land is not wanted for some little time and the plants are growing thickly together spraying with any of the commercial weed-killing preparations should prove successful. The plants should be dealt with, of course, prior to seeding.

Plate 8.—Sida Cordifolia, *Linn.*

General Notes.

PLANTATION LIFE IN MEXICO.

Perhaps a perusal of the following account of the difficulties of sugar planters in Mexico, republished from the "Louisiana Planter," in the "Queensland Sugar Journal," will give us pause, when we grumble over conditions in the agriculture world of Queensland, and tend to make us thankful that we, in spite of sundry labour difficulties, which periodically crop up, still live in a free country, and where no brigands can perform here as do the Mexican bandits.

It appears that having to their own satisfaction established the fact that Mexico is a country with soil and climate admirably adapted to the growth of sugar cane, some Americans formed a company with a capital of something over a million sterling, and up-to-date machinery was installed. An area of some 3,376 acres was planted, and the annual crop is said to have been at the rate of about 5 tons of sugar per acre. The outlook was most promising, until the revolution in 1911-12. Since then, as a contemporary remarks, "the plantation has not come to its own." In 1915, for example, the work was interrupted by bandits, and when the rainy season set in, 500 acres of the crop remained uncut. For three or four years, the bandits have done as they pleased. Labour was hard to obtain, because so many of the Mexicans delight in the life of adventure that hunts spoils, fights, and loves ease. These bandits came to the manager of the company, and demanded and obtained tribute of 2,000 dollars. Somewhat later another two thousand was taken, and this was followed by a third demand for the same sum, all of which was paid. Then they took possession of the plantation houses, robbing the company of merchandise, blankets, bedding and clothes. The place seemed to suit them in every way, and they made their headquarters at the mill for several weeks, so that all the operations of the factory ceased. Nearly ten thousand dollars were stolen in this way. Then, in August, 1915, Mr. Edward Wells, an American, who had been engaged as auditor, was brutally murdered and robbed of over eleven thousand dollars belonging to the company, which he was bringing to the head office. As all the employees of the company had been disarmed, there was no resistance. The company appealed to the State Department at Washington, with the result that might have been expected in view of all that has happened in Mexico. The bandits certainly were in no way perturbed as to the risk of punishment, for somewhat later they held up the boats engaged in bringing oil to the factory, with other raw material, and serious delay was the result. Still the company pushed ahead, and after surmounting tremendous difficulties they started crushing with about half their usual force.

No sooner had the factory started than the Government labour inspector arrived. These inspectors are employed by the military governor, and their word is law. They can even employ the military to enforce their demands. Their only compensation is derived from a portion of the fines they inflict. The inspector persuaded the labourers to leave the service of the company, though their wages at the time were double what the Government was paying. He preached anarchy, and caused old and previously faithful employees to leave. Work was suspended; everything that was moveable was taken away, and from 5,000 to 10,000 acres of cane were fired. As soon as the inspector had left, the manager and his workers were cited to appear before the local authorities on a charge of violating the labour laws, and five fines of £40 each were inflicted. The company was subjected to further impositions and injustices, and the labourers were so outraged that only the most faithful of them remained.

In spite of all this, crushing was carried on, and according to their annual report, the company had 13,200 bags of raw and centrifugal sugar ready for export. But the bandits now control the river bank, and threaten to sink any ship and shoot the crew, so no one ventures out. With the invasion of the American troops, the situation was only aggravated.

The company had even a cattle embargo to make things worse; for though they had 500 head at one of their stations, the governor, in view of military depredations committed every week, refused to allow the cattle to be shipped.

Industrially the country is paralysed; but it is hoped, we are told, that soon there will be a restoration of peace and prosperity.

WHEN THE CLOCK STOPS.

A clock will often stop without any apparent cause. In such a case it is probable that the works are choked up with dust. The remedy is to place in it a small piece of cotton waste soaked in kerosine, and leave it there for several hours. The fumes of the kerosine will loosen the dirt, and if dirt is the cause of the stoppage, the clock will go on as well as ever.

WATERMELON KOMFYT.

Take the skins (thick) of one small watermelon, peel the green part off and prick with a fork. Then lay in clean water (to which a dessertspoonful of lime has been added) over night. Next morning wash off and boil up in clean water, then drain and add ¾ lb. of sugar to 1 lb. skins, and cover with clean cold water. Boil till clear and tender. A few pieces of bruised ginger added will improve the flavour. This is a delicious preserve.

A GOOD FLY-TRAP.

In a month or two—just so soon as spring puts in an appearance—the stable fly will be with us again. The fly is man's filthiest enemy and is responsible for more disease than we know. The gastric troubles from which youngsters suffer—probably, infantile paralysis—are due to the fly.

Wouldn't you like to do without the fly?

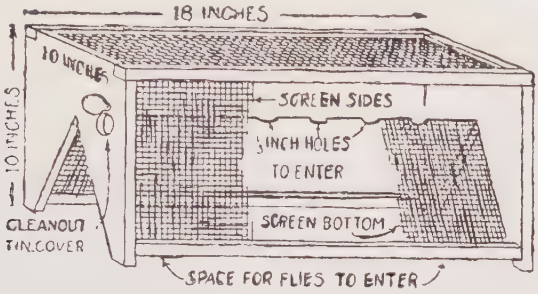
Mr. J. R. McKee says you can. He has invented a trap which, he says, works like a charm. He holds no patents because he wants every home to get rid of flies. He put some of these traps near the kitchen and the stables and caught a million. Here they are in the picture:

You don't want to count them; in fact, you wouldn't touch the heap of death-dealing, germ-laden filth if you could. The "million" is not a guess but a careful estimate, based on the counting of the dead flies in several small batches, and weighing each batch on accurate scales; then the batches were put together until they were approximately the million shown in the photographic evidence. A batch averaged 6,000 dead flies to the ounce, and each fly was provided with six legs, making a total of 36,000 feet to the ounce, every one a spongy receptacle for receiving and transferring millions of germs!

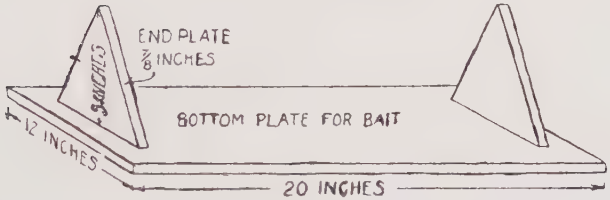
These flies were caught in the early part of the summer in the traps placed about the grounds, particularly between the house and the stables, but none of them were in the house or on the verandas. The usual fly delicacies were used for bait and included sugar, molasses, and fish bones. The open-air dining spaces were not the only places benefited, but the kitchens, pantries, and even the stables themselves.

The trap may be made any size, as the principle is the same and based on the fact that a fly will always crawl or fly upwards in its efforts to escape from an enclosure. As is shown in the detail drawing, the fly crawls under the wire-netting on to the baseboard, painted white

as an added lure, where the bait is placed. The fly find itself under an inverted V-shaped piece of screening, with half a dozen small holes along the top. It crawls up to the sides of the trap or flies to the top till it finds one of the holes, through which it goes into the trap proper,



This is the Fly Trap Which Was Found So Effective



which is simply a rectangle placed over the V and above the bait, and there his doom is sealed, for, though ingress is easy, egress is impossible.

The women of the country are the ones to carry on this work, and through them the children's aid should be enlisted.

Let us get into this fly-killing business, Queenslanders!—Farm Bulletin.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JULY, 1917.

Article.		JULY. Prices.
Bacon	lb.	9d. to 1s.
Barley	bush.	2s. to 2s. 6d.
Bran	ton	£5 15s.
Broom Millet	„	£32
Butter	cwt.	158s. 8d.
Chaff, Mixed	ton	£3
Chaff, Oaten	„	£6 to £6 10s.
Chaff, Lucerne	„	£6 to £7
Chaff, Wheaten	„	£4 to £5 10s.
Cheese	lb.	9d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 4d.
Hay, Oaten	ton	...
Hay, Lucerne	„	£4 15s.
Honey	lb.	4d. to 4½d.
Maize	bush.	2s. 7d. to 2s. 8d.
Oats	„	1s. 6d. to 2s. 6d.
Onions	ton	£7 to £8
Peanuts	lb.	3d.
Pollard	ton	£7 2s. 6d.
Potatoes	„	£5 10s. to £6 10s.
Potatoes (Sweet)	cwt.	3s.
Pumpkins (Cattle)	ton	£1 to £2
Eggs	doz.	1s. 7d. to 1s. 9d.
Fowls	per pair	3s. to 6s.
Ducks, English	„	3s. 6d. to 4s.
Ducks, Muscovy	„	4s. 6d. to 8s.
Geese	„	6s. to 7s.
Turkeys (Hens)	„	9s 9d.
Turkeys (Gobblers)	„	12s. 6d.
Wheat	bush.	3s. 7d.

VEGETABLES—TURBOT STREET MARKETS.

Cabbages, per dozen	3s. to 6s.
Cauliflowers, per dozen	6s. to 10s.
Celery, per bundle	..
Beans, per sugar bag	7s. to 12s.
Peas, per sugar bag	7s. to 13s.
Carrots, per dozen bunches	10d. to 1s.
Chocos, per quarter-case	2s. to 2s. 6d.
Beetroot, per dozen bunches	8d. to 9d.
Lettuce, per dozen	1s. to 2s.
Marrows, per sack	5s. to 5s. 6d.
Parsnips, per bundle	7d. to 10d.
Sweet Potatoes, per sugar bag	1s. 6d.
Table Pumpkins, per dozen	1s. 6d. to 2s. 4d.
Tomatoes, per quarter-case	2s. to 5s.
Rhubarb, per dozen bundles	...

SOUTHERN FRUIT MARKETS.

Article.	JULY. Prices.
Bananas (Queensland), per case	8s. to 10s.
Bananas (Tweed River), per case	8s. to 13s.
Bananas (Fiji), per case	4s. 6d. to 6s.
Bananas (G.M.), per bunch	5s. 6d. to 7s.
Bananas (G.M.), per case	16s. 6d. to 18s. 6d.
Custard Apples, per twelve to fifteen tray	...
Guavas, per case	2s. to 4s.
Lemons (Local), per bushel-case	2s. 6d. to 3s.
Mandarins, per case	2s. to 6s.
Oranges (Navel), per case	8s. to 12s.
Oranges (other), per case	2s. to 5s. 6d.
Papaw Apples, per half-bushel-case	1s. 6d. to 2s.
Passion Fruit, per half-case	4s.
Persimmons, per half-case	...
Pineapples (Queens), per double-case	6s. to 10s.
Pineapples (Ripleys), per double-case	6s. to 7s.
Pineapples (Common) per double-case	6s. to 7s.
Tomatoes (Queensland), per half-bushel-case	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JULY. Prices.
Apples, Eating, per bushel case	12s. 6d. to 14s.
Apples, Cooking, per bushel case	12s. to 14s.
Bananas (Cavendish), per dozen	1¼d. to 4d.
Bananas (Sugar), per dozen	2d. to 4⅕d.
Citrons, per hundredweight	10s.
Cocoanuts, per sack	12s. to 15s.
Cumquats, per quarter-case	3s. to 3s. 6d.
Custard Apples, per quarter-case	5s. to 7s.
Granadillas, per quarter-case	...
Grapes, per lb.	...
Lemons (Lisbon), per quarter-case	3s. to 6s.
Limes, per quarter-case	...
Mandarins, per quarter-case	3s. to 8s,
Oranges (Navel), per case	9s. to 10s.
Oranges (Seville), per hundredweight	11s.
Oranges (other), per hundredweight	2s. to 4s. 6d.
Papaw Apples, per quarter-case	1s. 3d. to 2s.
Passion Fruit, per quarter-case	4s. 6d. to 5s.
Pears, per quarter-case	8s. to 10s.
Peanuts, per lb.	3d.
Persimmons, per quarter-case	...
Pineapples (Riplevs), per dozen	6d. to 2s. 6d.
Pineapples (Rough), per dozen	6d. to 2s. 6d.
Pineapples (Smooth), per dozen	1s. to 2s. 6d.
Pomeloes, per hundredweight	...
Quinces, per quarter-case	...
Rosellas, per sugar bag	...
Strawberries, per dozen boxes	5s. to 9s.
Tomatoes, per quarter-case	2s. to 5s. 3d.

TOP PRICES, ENOGGERA YARDS, JUNE, 1917.

Animal.	JUNE. Prices.
Bullocks	£19 12s. 6d. to £26
Cows	£11 5s. to £15 2s. 6d.
Cows (Single)	£18 2s. 6d.
Merino Wethers	43s.
Crossbred Wethers	45s.
Merino Ewes	31s. 6d.
Crossbred Ewes	44s. 6d.
Lambs	38s.
Pigs (Porkers)	55s.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JUNE, 1917, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JUNE, 1917 AND 1916, FOR COMPARISON.

Divisions and Stations.	Average Rainfall. June.	Average Rainfall. No. of Years' Records.	Total Rainfall. June, 1917.	Total Rainfall. June, 1916.
North Coast.	In.		In.	In.
Atherton	1·85	15	0·51	0·51
Cairns	2·92	34	0·38	2·21
Cardwell	2·13	44	0·36	1·00
Cooktown	2·10	40	0·30	1·47
Herberton	1·04	29	0·30	0·30
Ingham	2·53	24	0·48	1·88
Innisfail	7·27	35	4·23	3·39
Mossman	1·41	4	0·79	1·45
Townsville	1·39	45	0·07	0·26
Central Coast.				
Ayr	1·44	29	0·42	0·11
Bowen	1·69	45	0·61	0·33
Charters Towers	1·52	34	0·04	0·16
Mackay	2·80	45	0·54	1·81
Proserpine	4·31	13	1·16	1·56
St. Lawrence	2·60	45	0·40	0·92
South Coast.				
Biggenden	1·99	17	0·07	2·54
Bundaberg	2·89	33	0·04	3·33
Brisbane	2·63	66	0·21	2·79
Childers	2·36	21	Nil	2·73
Crohamhurst	4·13	25	0·58	3·06
Esk	2·05	29	0·27	2·36
Gayndah	1·87	45	0·05	2·21
Gympie	2·58	46	0·56	1·86
Glasshouse M'tains	4·52	8	0·70	2·88
Kilkivan	2·03	37	Nil	1·96
Maryborough	2·93	45	0·27	3·14

Divisions and Stations.	Average Rainfall. June.	Average Rainfall. No. of Years' Records.	Total Rainfall. June, 1917.	Total Rainfall. June, 1916.
South Coast—continued:	In.		In.	In.
Nambour	3·59	20	0·27	2·57
Nanango	2·00	34	0·09	2·37
Rockhampton	2·12	29	0·16	1·80
Woodford	2·71	29	0·48	2·24
Darling Downs.				
Dalby	1·65	46	0·62	2·80
Emu Vale	1·44	20	0·25	1·72
Jimbour	1·65	28	0·59	2·45
Miles	1·99	31	0·25	2·95
Stanthorpe	1·79	43	0·70	3·13
Toowoomba	2·35	44	0·60	3·52
Warwick	1·67	29	0·31	2·01
Maranoa.				
Roma	1·68	42	0·34	3·11
State Farms, &c.				
Bungeworgorai	1·72	5	0·40	3·07
Gatton College	1·72	17	0·16	1·95
Gindie	1·67	17	0·49	1·29
Hermitage	2·07	10	0·40	1·95
Kairi	0·88	5	0·23	0·34
Kamerunga	2·72	26	0·35	0·95
Sugar Experiment Station, Mackay	2·55	19	0·64	2·10
Warren	1·97	5	Nil	1·82

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for June this year and for the same period of 1916, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE AND THE PHASES OF THE MOON

1917.	MAY.		JUNE.		JULY.		AUGUST.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·13	5·17	6·32	4·59	6·40	5·4	6·30	5·18
2	6·13	5·16	6·32	4·59	6·40	5·4	6·30	5·18
3	6 14	5·15	6·33	4·59	6·40	5·4	6·29	5·19
4	6 15	5·14	6·33	4·59	6·40	5·5	6·29	5·19
5	6·15	5·14	6·33	4 59	6·40	5·5	6·28	5·20
6	6·16	5·13	6 34	4·59	6·40	5 5	6·28	5·20
7	6·15	5·12	6·34	4·59	6·40	5·6	6·27	5·21
8	6·17	5·12	6·34	4·59	6·40	5·6	6·26	5·21
9	6·17	5·11	6·35	4 59	6·40	5·6	6 25	5 22
10	6 18	5·11	6·35	4·59	6 39	5·7	6·24	5·22
11	6·19	5·10	6·35	5 0	6·39	5·7	6 23	5·23
12	6 20	5·9	6·36	5·0	6·39	5 8	6 22	5·23
13	6 21	5·9	6·36	5·0	6·39	5·8	6 21	5 24
14	6·21	5·8	6·36	5·0	6 39	5·9	6·20	5·24
15	6·22	5·8	6·36	5 0	6 38	5·9	6·19	5·25
16	6 23	5·7	6·37	5·0	6·38	5·10	6·18	5·25
17	6·23	5·7	6 37	5·0	6·38	5·10	6·17	5·26
18	6·24	5·6	6·37	5·0	6·37	5·11	6·16	5·27
19	6·24	5·6	6·37	5·0	6 37	5·11	6·15	5·27
20	6·25	5·5	6·38	5·0	6 36	5·12	6 14	5·28
21	6·25	5·5	6·38	5·1	6 36	5·12	6·13	5·28
22	6·26	5·4	6·38	5·1	6·35	5·13	6 12	5 29
23	6·27	5·3	6·38	5·1	6·35	5·13	6·11	5·29
24	6·27	5·3	6·38	5·1	6 34	5·14	6·10	5·30
25	6·28	5·2	6 39	5·2	6 34	5·14	6·9	5·30
26	6·29	5 2	6 39	5·2	6·33	5 15	6·8	5·31
27	6·29	5·1	6 39	5·2	6·33	5·15	6·7	5·31
28	6·30	5 1	6·39	5·3	6 32	5·16	6·6	5·32
29	6 30	5·0	6·39	5·3	6 32	5·16	6·5	5·32
30	6 31	5·0	6·39	5·3	6·31	5·17	6·4	5·33
31	6 31	4·59	...	...	6·31	5·17	6·3	6·33

The times given are for the whole of Queensland, New South Wales, and Victoria, where the same Standard Time is observed.

			H.	M.	
7 May	○	Full Moon	12	43	p.m.
14 „	☽	Last Quarter	11	48	a.m.
21 „	●	New Moon	10	47	„
29 „	☾	First Quarter	9	33	„

The Moon will be nearest the earth on the 14th, and at its farthest distance on the 28th.

5 June	○	Full Moon	11	7	p.m.
12 „	☽	Last Quarter	4	38	„
19 „	●	New Moon	11	2	„
28 „	☾	First Quarter	2	8	a.m.

The Moon will be nearest the earth on the 9th, and at its farthest distance on the 25th. It will cause a partial Eclipse of the Sun on the 19th, visible in the Arctic Regions but not in Australia.

5 July	○	Full Moon	7	40	a.m.
11 „	☽	Last Quarter	10	12	p.m.
19 „	●	New Moon	1	0	„
27 „	☾	First Quarter	4	40	„

The moon will be nearest the earth on the 7th, and at its greatest distance on the 22nd. There will be a *Total Eclipse* of the *Moon* from 6 51 to 8·27 a.m. on the 5th; but only the moon's entrance into the shadow of the earth will be seen in Eastern Australia.

3 Aug.	○	Full Moon	3	11	p.m.
10 „	☽	Last Quarter	5	56	a.m.
18 „	●	New Moon	4	21	„
26 „	☾	First Quarter	5	8	„

The moon will be nearest the earth on the 4th, and at its greatest distance on the 18th.

* For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during May, June, and July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

* These notes will not again be published until September, as they apply to the series from May to August.

Farm and Garden Notes for September.

FIELD.—Spring has now arrived, and with it there will be the usual trouble with weeds, especially on carelessly prepared ground. Therefore, the cultivator and the horse and hand hoe must be kept vigorously at work to check the weed pests and save the growing crops as well as much future labour. Attend to earthing up any crop which may require it. There may possibly occur drying winds, dry weather, and even very late frosts, which have not been unknown in parts of this State even as late as September. Still, good showers may be looked for in October, and much useful work may be done during the present month which will go far to afford a fair prospect of a good return for labour. Plant out *Agave rigida*, var. Sisalana (sisal hemp plant), in rows 6 to 8 ft. apart, according to the richness of the soil. All dry places on the farm, too rocky or too poor for any ordinary crops, should be planted with this valuable aloe. Especially should limestone country be selected for the purpose. If the soil is very poor, and the plants very small, it is better to put the latter out into a nursery of good soil, about 1 ft. apart. Next year they will be good-sized plants. Keep down tall weeds in the plantation, and do not allow couch or buffalo grass to grow about the roots. Sisal will do no good if planted on low-lying wet land, or on a pure sandy soil. It thrives best where there is plenty of lime, potash, and phosphoric acid, all of which (except potash, unobtainable under present war conditions) can be cheaply supplied if wanting in the soil. Sisal requires so little labour from planting to maturity that it can be grown to good profit despite the high cost of white labour. The price of the fibre now ranges from £70 to £95 per ton for British East African, the Mexican being unobtainable. Sow cotton—Sea Island near the coast, and Uplands generally. Caravonica succeeds best in North Queensland. Sow maize, sorghum, imphee, mazzagua, Indian cane, prairie grass, Rhodes grass and paspalum, panicum, tobacco, pumpkins, and melons. Sugar-cane planting should be vigorously carried on. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, ginger, and canaigre, the latter a tuber yielding a valuable tanning substance. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing many kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost. Failing a sufficient supply of these, artificials may be used with good results. Dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and in the latter case, stir the soil early next day to prevent caking. Mulching with straw, leaves, or litter will be of great benefit as the season becomes hotter. It is a good thing to apply a little salt to newly dug beds. What the action of salt is, is not exactly known, but when it is applied as a top dressing it tends to check rank growth. A little is excellent for cabbages, and especially for asparagus, but too much renders the soil sterile, and causes hardpan to form. French or kidney beans may now be sown in all parts of the State. The Lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 ft. apart and 18 in. between the plants, and the climbing sorts 6 ft. each way. Sow Guada bean, providing a trellis for it to climb on later. Sow cucumbers, melons, marrows, and squash at once. If they are troubled

by the red beetle, spray with Paris green or London purple. In cool districts, peas and even some beetroot may be sown. Set out egg plants in rows 4 ft. apart. Plant out tomatoes 3½ ft. each way, and train them to a single stem, either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, vegetable marrows, custard marrows, parsnips, carrots, chicory, eschalots, cabbage, radishes, kohl-rabi, &c. These will all prove satisfactory, provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

FLOWER GARDEN.—Continue to plant bulbs as directed last month. Protect the plants as much as possible from cold westerly winds, which may still occur, notwithstanding the increasing temperature. Be careful that the bulbs do not come in contact with fresh manure. Keep a good lookout for slugs. Plant out chrysanthemums, palms, and all kinds of tropical and semi-tropical plants. If hot weather should ensue after planting, water and shade must be given. Sow dianthus, snapdragon, and coleus, seed or cuttings of the latter. Roses will now be in full bloom. Keep them free from aphis, and cut off all spent blooms. This latter work should be done in the case of all flowers. If you wish to save seeds, do not wait for the very last blooms, but allow some of the very best to go to seed. If you have any toads in the garden or bush-house, encourage them to take up their abode there. They are perfectly harmless, in spite of their ugliness, and they destroy an astonishing number of insects injurious to plants. Fill up all vacancies with herbaceous plants. Sow zinnia, gaillardia, amaranthus, cockscomb, balsam, sunflower, marigold, cosmos, summer chrysanthemum, coreopsis, portulaca, mesembryanthemum, calendula, &c.

Orchard Notes for September.

THE SOUTHERN COAST DISTRICTS.

The marketing of citrus fruits, in the later districts, of the late winter or early spring crop of pines and bananas, also of strawberries and Cape gooseberries, will continue to occupy the attention of fruitgrowers. We can only repeat the advice we have so often given in these Notes respecting the marketing of all kinds of fruit—viz., to grade the fruit evenly, pack honestly, and display it to the best advantage if you want to get good returns.

September is a very important month to the fruitgrower, owing to the fact that it is usually a dry month, and that it is essential in all cases to keep the land in a high state of tilth, so as to retain the moisture that is required by the various trees that are in blossom, thus securing a good set of fruit. Where irrigation is available, it is advisable to give the trees a good watering should the ground be dry, as this will induce a good growth and cause the fruit to set well. If an irrigation is given, it should be a thorough one, not a mere surface watering, and once the land is saturated the moisture must be retained in the soil by constant and systematic cultivation. If this is done, one good watering will usually be enough to carry the trees through in good condition to the thunderstorms that come later or even to the summer rains, if the soil is of a deep sandy loamy nature.

No weeds must be allowed in the orchard or vineyard at this time of the year, as they are robbing the trees and plants of both the water and plant food that are so essential to them at this period of their growth.

There is not much to be done in the way of fighting scale insects during the month, as they are more effectually dealt with later on; but where young trees are showing signs of distress, owing to the presence of scale insects, they should be treated, the gas method being the most efficacious.

Beetles and other leaf-eating insects often make their appearance during the month. The best remedy is to spray the trees or plants with one or other of the arsenical washes that are recommended by me in this Journal. The vineyard will require considerable attention. Not only must it be kept well worked, but any vines that are subject to the attack of black spot must be sprayed from time to time with Bordeaux mixture. Disbudding must be carefully carried out, as this work is equally as important as the winter pruning, as it is the best means of controlling the future shape of the vine. A very common fault with vines grown in the coast districts is that the buds often remain dormant, only the terminal bud and possibly one other starting into growth, thus leaving a long bare space on the main rods, which is undesirable. When this takes place, pinch back those shoots that have started, and which are taking the whole of the sap, and force the sap into the dormant buds, thus starting them into growth. This will result in an even growth of wood all over the vine—not a huge cane in one part and either a stunted growth or dormant buds on the rest.

Every care should be taken during the month to prevent the fruit-fly from getting an early start. All infested oranges, loquats, kumquats, or other fruits should be gathered and destroyed, as the keeping in check of the early spring crop of flies, when there are only comparatively few to deal with, will materially lessen the subsequent crops. Land that is to be planted to pines or bananas should be got ready now, though the planting need not be done till October, November, or even later. Prepare the land thoroughly; don't scratch the surface to the depth of a few inches, but plough as deeply as you have good surface soil, and break up the subsoil as deeply as you can possibly get power to do it. You will find that the extra money expended will be a profitable investment, as it will pay every time.

THE TROPICAL COAST DISTRICTS.

September is usually a very dry month, and fruit trees of all kinds suffer in consequence. The spring crop of citrus fruits should be harvested by the end of the month, as, if allowed to hang later, there is a great risk of loss by fly. The fruit should be well sweated, and, if carefully selected, well-graded, and well packed, it should carry well to, and fetch high prices in, the Southern States, as there are no oranges or mandarins grown in Australia that can excel the flavour of the best of the Bowen, Cardwell, Cairns, Port Douglas, or Cooktown fruit.

As soon as the fruit is gathered, the trees should be pruned and sprayed with the lime and sulphur wash, as this wash is not only a good insecticide, but it will keep down the growth of all lichens, mosses, &c., to which the trees are very subject.

Every care should be taken to keep down the crop of fruit-fly during the month. All infested fruit should be gathered and destroyed, particularly that in or adjacent to banana plantations. Watch the

banana gardens carefully, and keep well cultivated. New land should be got ready for planting, and where land is ready planting can take place.

Papaws and granadillas are in good condition now, and, if carefully gathered and well packed in cases only holding one layer of fruit, they should carry well to the Southern markets if sent in the cool chamber.

THE SOUTHERN AND CENTRAL TABLELANDS.

Prune grape vines at Stanthorpe in the early part of the month, leaving the pruning as late as possible, as the object is to keep the vines back in order to escape damage from late spring frosts. All vines subject to the attack of black spot should be treated with the winter dressing when the buds are swelling; this treatment to be followed by spraying with Bordeaux mixture later on.

Where fruit trees have not received their winter spraying, they should be treated at once before they come out into flower or young growth. Where the orchard or vineyard has not been ploughed, do so, taking care to work the land down fine as soon as it is ploughed, so as to keep the moisture in the soil, as the spring is always the trying time for fruit trees.

Look out for fruit-fly in the late oranges and loquats in the Toowoomba district. Keep the orchards and vineyards well cultivated; disbud the vines when sufficiently advanced. Spray for codlin moth.

In the Central tablelands irrigate vines and fruit trees, and follow the irrigation with deep, constant, and systematic cultivation. Keep down all weed growth, and fight the red scale on citrus trees with cyanide. The objective of the fruitgrowers throughout Queensland during September and the following months is, "How best to keep the moisture in the soil that is required by the trees, vines, plants, and vegetables"; and this objective can only be obtained by irrigation where same is available, or by deep, systematic, and constant cultivation where there is no water available for irrigation.

We have received from Mr. A. E. Stephens, F.C.S., Director for Australia of the Chilian Nitrate of Soda Propaganda, the following comment on our article on "Fertilisers and the Value of Potash in Agriculture," by Dr. Voelcker. We feel sure that farmers and all others engaged in agriculture and market gardening will read the article with much interest, and also act on it.

FERTILISERS IN WAR TIME—NITRATE OF SODA.

The extracts quoted in the July issue from Dr. Voelcker's paper, "Fertilisers and their Supply in War Time," which he read at the meeting of the Royal Society of Arts in London last March, are hardly applicable to Australia.

Dr. Voelcker's remarks applied essentially to conditions prevailing in Great Britain during war time.

In Australia at the present time nitrate of soda is more easily procurable and considerably cheaper per ton than sulphate of ammonia.

During the last twelve months over 9,000 tons of nitrate of soda have been imported into Australia, and although the price is £5 or £6 higher per ton—which is due to a corresponding increase in the shipping freights—than it was before the war, it can now be procured from all manure merchants at prices ranging from £19 to £21 per ton. The imports for the previous year were about 5,000 tons.

Sulphate of Ammonia is procurable only in limited quantities at prices varying from £25 to £28 per ton.

Comparing the utility of the two nitrogenous fertilisers in those localities where nitrogen is more or less a necessity, the conditions in Australia are again almost exactly the reverse of those in England.

Owing to the prevailing deficiency of lime in a great portion of our Australian soils the use of a nitrogenous fertiliser which has an alkaline base, like nitrate of soda, is to be preferred to an acid salt, like sulphate of ammonia, which latter makes great demands on the lime contents of the soil.

In Queensland, where it has been tried on sugar cane, nitrate of soda has already proved its immense crop increasing capabilities, and used correctly probably no other individual fertiliser can produce such striking increases in yield. For fruit and vegetable crops and maize the results in most cases also demonstrate the value of nitrate of soda.

Much more could be said of the merits of nitrate of soda over sulphate of ammonia, although the latter generally gets preference from manure manufacturers owing to its being better suited for incorporating in mixtures, the main base of which is superphosphate.

In the present unavoidable absence of potash manure, the property which nitrate of soda possesses in liberating otherwise insoluble potash which may exist in the soil should not be overlooked—a property which is not possessed by sulphate of ammonia.

It is only owing to the shortage of tonnage and the fact that practically the whole of the nitrate of soda now being imported into Great Britain is being requisitioned by the British Government for munition making purposes, that the different agricultural chemists and officials in Great Britain are trying to induce farmers there to use sulphate of ammonia instead of the invariably more favoured nitrate of soda for the purpose of manuring their crops—a state of affairs which has already been said does not at present apply to Australia, as your article in the July issue might possibly lead many people to believe.

Although the prices of fertilisers are generally higher all round than in pre-war time, it is practically only potash manures and basic slag that are unprocurable now in Australia.

Strong efforts are being made to discover some means of producing potash in Australia itself, and the manufacture of *basic*-superphosphate provides an even better substitute for basic slag.

The following is a list of the manures, other than proprietary mixtures, which are available:—

Phosphatic Manures.—Superphosphate, basic superphosphate.

Phosphatic and Nitrogenous Manures.—Bone dust, meat works fertilisers, blood and bone.

Nitrogenous Manures.—Nitrate of soda, sulphate of ammonia, dried blood.